EXHIBIT A (Marked-Up Version)

Claims

What is claimed is:

1. A plurality of metallic fibers, the fibers being manufactured by milling.

2. The fibers of Claim 1, wherein the mill has been controlled so as to produce fibers of a consistent width, depth and length.

3. The fibers of Claim 2, the fibers being milled from at least one piece of stock material by a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis.

4. The fibers of Claim 3, wherein the CNC milling machine comprises a cutting tool, and wherein the position of the cutting tool in the X-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent width.

5. The fibers of Claim 3, wherein the CNC milling machine comprises a cutting tool, and wherein the position of the cutting tool in the Y-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent depth.

6. The fibers of Claim 3, wherein the at least one piece of stock material is of a predetermined thickness and the length of the fibers being milled by the CNC milling machine is a function of the thickness of the at least one piece of stock material.

7. The fibers of Claim 6, wherein the at least one piece of stock material comprises a plurality of pieces of stock material, each of the plurality of pieces of stock material having a predetermined thickness and the length of the fibers being milled by the CNC milling machine is a function of the thicknesses of the plurality of pieces of stock material.

8. The fibers of Claim 3, wherein the CNC milling machine comprises a cutting tool, and wherein:

the position of the cutting tool in the Y-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent depth; and

the position of the cutting tool in the X-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent width.

9. The fibers of Claim 8, wherein the CNC milling machine comprises a generally cylindrical cutting tool, the cutting tool comprising:

at least one helically disposed cutting edge on the outer periphery of the cutting tool, and

at least one notch in the cutting edge, the notch of a depth exceeding the cross-bite of the cutting tool when the cutting tool is milling a piece of stock material, so that as the notch rotates

over the piece of stock material, the piece of stock material is not cut by the cutting edge at the location of the at least one notch, such that the length of the fibers being milled is a function of the location of the notch on the cutting edge relative to the piece of stock material.

10. The fibers of Claim 9, the fibers having a length between about 0.012 inches and about 6 inches.

11. The fibers of Claim 10, the fibers having a length between about 0.125 inches and about 0.75 inches.

12. A battery plate for use in an electrochemical cell and the like, comprising:

a plurality of fibers in conductive contact one with another, the plurality of fibers being manufactured by milling.

13. The battery plate of Claim 12, wherein the mill has been controlled so as to produce fibers of a consistent width, depth and length.

14. The battery plate of Claim 13, the fibers being milled from at least one piece of stock material by a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis.

15. The battery plate of Claim 14, wherein the CNC milling machine comprises a cutting tool, and wherein the position of the cutting tool in the X-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent width.

16. The battery plate of Claim 14, wherein the CNC milling machine comprises a cutting tool, and wherein the position of the cutting tool in the Y-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent depth.

17. The battery plate of Claim 14, wherein the at least one piece of stock material is of a predetermined thickness and the length of the fiber being milled by the CNC milling machine is a function of the thickness of the at least one piece of stock material.

18. The fibers of Claim 17, wherein the at least one piece of stock material comprises a plurality of pieces of stock material, each of the plurality of pieces of stock material having a predetermined thickness and the length of the fibers being milled by the CNC milling machine is a function of the thicknesses of the plurality of pieces of stock material.

19. The battery plate of Claim 14, wherein the CNC milling machine comprises a cutting tool, and wherein:

the position of the cutting tool in the Y-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent depth; and

the position of the cutting tool in the X-axis is controlled relative the at least one piece of stock material so as to produce fibers of a consistent width.

20. The battery plate of Claim 19, wherein the CNC milling machine comprises a generally cylindrical cutting tool, the cutting tool comprising:

at least one helically disposed cutting edge on the outer periphery of the cutting tool, and

at least one notch in the cutting edge, the notch of a depth exceeding the cross-bite of the cutting tool when the cutting tool is milling a piece of stock material, so that as the notch rotates over the piece of stock material, the piece of stock material is not cut by the cutting edge at the location of the at least one notch, such that the length of the fibers being milled is a function of the location of the notch on the cutting edge relative to the piece of stock material.

21. The battery plate of Claim 20, the fiber having a length between about 0.012 inches and about 6 inches.

22. The battery plate of Claim 21, the fiber having a length between about 0.125 inches and about 0.75 inches.

23. A battery plate according to Claim 20, wherein the CNC milling machine comprises a generally cylindrical carbide cutting tool.

24. A battery plate according to Claim 23, wherein the at least one piece of stock material comprises zinc.

25. A method of manufacturing a metallic fiber, the method comprising the following steps:

providing at least one piece of stock material; and

milling from the at least one piece of stock material a fiber.

26. The method of Claim 25, wherein the step of milling comprises the step of controlling the mill so as to produce fibers of a consistent width, depth and length.

27. The method of Claim 26, wherein the step of milling comprises the following steps:

providing a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis; and

controlling the position of the cutting tool in the X-axis relative the at least one piece of stock material so as to produce fibers of a consistent width.

28. The method of Claim 26, wherein the step of milling comprises the following steps:

providing a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis; and

controlling the position of the cutting tool in the Y-axis relative the at least one piece of stock material so as to produce fibers of a consistent depth.

29. The method of Claim 25, wherein the step of providing at least one piece of stock material comprises the step of providing at least one piece of stock material of a predetermined thickness such that the length of the fibers milled by the milling machine is controlled as a function of the thickness of the at least one piece of stock material.

30. The method of Claim 29, wherein the step of providing at least one piece of stock material of a predetermined thickness comprises the step of providing at least one piece of stock material of a predetermined thickness between about 0.012 inches and about 6 inches.

31. The method of Claim 29, wherein the step of providing at least one piece of stock material comprises the step of providing a plurality of pieces of stock material, each of the plurality of pieces of stock material having a predetermined thickness such that the length of the fibers being milled by the CNC milling machine is a function of the thicknesses of the plurality of pieces of stock material.

32. The method of Claim 26, wherein the step of milling comprises the following steps:

providing a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis; and

controlling the CNC milling machine in the Y-axis relative the at least one piece of stock material so as to produce fibers of a consistent depth; and

controlling the CNC milling machine in the X-axis relative the at least one piece of stock material so as to produce fibers of a consistent width.

33. The method of Claim 32, wherein the step of milling comprises the following steps:

providing a generally cylindrical cutting tool in the CNC milling machine controllable in the Z-axis, the cutting tool comprising:

at least one helically disposed cutting edge on the outer periphery of the cutting tool, and

at least one notch in the cutting edge, the notch of a depth exceeding the cross-bite of the cutting tool when the cutting tool is milling a piece of stock material, so that as the notch rotates over the piece of stock material, the piece of stock material is not cut by the cutting edge at the location of the at least one notch; and

controlling the CNC milling machine in the Z axis so as to produce fibers of a consistent length as a function of the location of the notch on the cutting edge relative to the at least one piece of stock material.

34. The method of Claim 33, wherein the step of controlling the CNC milling machine in the Z axis comprises the step of controlling the length of the fibers to be between about 0.125 inches and about 0.75 inches.

35. A method of manufacturing an electrode for use in an electrochemical cell and the like, the method comprising the following steps:

providing fibers milled from a piece of stock material; and

forming from the fibers an electrode.

36. The method of claim 35, step of providing fibers comprising the following steps:

providing at least one piece of stock material; and

milling from the at least one piece of stock material a fiber.

37. (Amended) The method of Claim 36, wherein the step of milling comprises the step of controlling the mill so as to produce a first group of fibers of a consistent width, depth and length.

38. The method of Claim 37, wherein the step of milling comprises the following steps:

providing a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis; and

controlling the position of the cutting tool in the X-axis relative the at least one piece of stock material so as to produce fibers of a consistent width.

39. The method of Claim 37, wherein the step of milling comprises the following steps:

providing a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis; and

controlling the position of the cutting tool in the Y-axis relative the at least one piece of stock material so as to produce fibers of a consistent depth.

40. The method of Claim 36, wherein the step of providing at least one piece of stock material comprises the step of providing at least one piece of stock material of a predetermined thickness such that the length of the fibers milled by the milling machine is controlled as a function of the thickness of the at least one piece of stock material.

41. The method of Claim 40, wherein the step of providing at least one piece of stock material of a predetermined thickness comprises the step of providing at least one piece of stock material of a predetermined thickness between about 0.012 inches and about 6 inches.

42. The method of Claim 40, wherein the step of providing at least one piece of stock material comprises the step of providing a plurality of pieces of stock material, each of the plurality of pieces of stock material having a predetermined thickness such that the length of the fibers being milled by the CNC milling machine is a function of the thicknesses of the plurality of pieces of stock material.

43. The method of Claim 37, wherein the step of milling comprises the following steps:

providing a computer number control (CNC) milling machine controllable in an X-axis, a Y-axis and a Z-axis; and

controlling the CNC milling machine in the Y-axis relative the at least one piece of stock material so as to produce fibers of a consistent depth; and

controlling the CNC milling machine in the X-axis relative the at least one piece of stock material so as to produce fibers of a consistent width.

44. The method of Claim 43, wherein the step of milling comprises the following steps:

providing a generally cylindrical cutting tool in the CNC milling machine controllable in the Z-axis, the cutting tool comprising:

at least one helically disposed cutting edge on the outer periphery of the cutting tool, and

at least one notch in the cutting edge, the notch of a depth exceeding the cross-bite of the cutting tool when the cutting tool is milling a piece of stock material, so that as the notch rotates over the piece of stock material, the piece of stock material is not cut by the cutting edge at the location of the at least one notch; and

controlling the CNC milling machine in the Z axis so as to produce fibers of a consistent length as a function of the location of the notch on the cutting edge relative to the at least one piece of stock material.

45. The method of Claim 44, wherein the step of controlling the CNC milling machine in the Z axis comprises the step of controlling the length of the fibers to be between about 0.125 inches and about 0.75 inches.

46. The method of Claim 37, wherein, the step of forming from the fibers an electrode comprises the steps of:

providing a pressing machine; and

pressing the fibers with the pressing machine into an electrode.

47. The method of Claim 46, wherein the step of providing a pressing machine comprises the step of selecting a mold to be used in the pressing machine, the mold being in the shape of an electrode for use in a cell from the following group of cells:

a button cell;

a cylindrical cell;

a wafer cell;

a rectangular cell; and

a flat cell, and wherein the step of pressing the fibers comprises the step of pressing the fibers into an electrode for use in a cell corresponding to the mold shape selected.

48. The fibers of Claim 2, wherein the mill has been controlled so as to produce fibers which are twisted and curled.

49. The battery plate of Claim 20, wherein the mill has been controlled so as to produce fibers which are twisted and curled.

50. The method of Claim 26, wherein the step of milling comprises the step of controlling the mill so as to produce fibers which are twisted and curled.

51. The method of Claim 37, wherein the step of forming from the fiber an electrode comprises the step of placing the fiber into a mold.

52. The method of Claim 51, wherein the step of controlling the mill comprises the step of controlling the mill to produce fibers having a consistent length of between about 0.012 inches and about 6 inches.

53. The method of Claim 52, wherein the step of controlling the mill comprises the step of controlling the mill to produce fibers which are twisted and curled.

54. The method of Claim 37, wherein the step of forming from the fiber an electrode comprises the step of combining the fibers with a gelatinous agent.

55. The method of Claim 37, further comprising the step of controlling a mill so as to produce a second group of fibers having a consistent width, depth and length, the second group of fibers having at least one of the width, depth or length different from the width depth or length of the first group of fibers.

56. The method of Claim 55 wherein the step of forming from the fibers an electrode comprises the step of placing the first group of fibers and the second group of fibers into a mold.

57. The method of Claim 56, wherein the step of controlling a mill so as to produce a first group of fibers comprises the step of controlling a mill so as to produce fibers having a consistent length between about 0.012 and about 6 inches, and the step of controlling a mill so as to produce a second group of fibers comprises the steps of controlling a mill so as to produce a

second group of fibers having a consistent length between about 0.012 and about 6 inches different from that of the first group of fibers.

58. The method of claim 57, wherein the step of forming from the fibers an electrode comprises the steps of:

providing a pressing machine; and

pressing the at least two different consistent lengths with the pressing machine into an electrode.

59. The method of Claim 57, wherein the step of controlling a mill so as to produce a first group of fibers comprises the step of controlling a mill so as to produce fibers having a consistent length between about 0.012 inches and about 0.050 inches, and the step of controlling a mill so as to produce a second group of fibers comprises the step of controlling a mill so as to produce a second group of fibers having a consistent length between about 0.050 inches and about 6 inches.

60. The method of Claim 59, wherein the step of controlling a mill so as to produce a second group of fibers comprises the step of controlling a mill so as to produce a second group of fibers which are twisted and curled.

61. (New) The fibers of Claim 3, wherein the at least one piece of stock material comprises a metal selected from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

62. (New) The battery plate of Claim 14, wherein the at least one piece of stock material comprises a metal selected from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

63. (New) The method of Claim 26, wherein the step of providing at least one piece of stock material comprises the step of selecting at least one piece of stock material comprised of a metal from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

64. (New) The method of Claim 36, wherein the step of providing at least one piece of stock material comprises the step of selecting at least one piece of stock material comprised of a metal from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

61. (New) The fibers of Claim 3, wherein the at least one piece of stock material comprises a metal selected from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

62. (New) The battery plate of Claim 14, wherein the at least one piece of stock material comprises a metal selected from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

63. (New) The method of Claim 26, wherein the step of providing at least one piece of stock material comprises the step of selecting at least one piece of stock material comprised of a metal from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

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nickel;

titanium;

silver; and

zinc.

64. (New) The method of Claim 36, wherein the step of providing at least one piece of stock material comprises the step of selecting at least one piece of stock material comprised of a metal from the following group of metals and alloys thereof:

aluminum;

cadmium;

copper;

iron;

magnesium;

nickel;

titanium;

silver; and

zinc.

REMARKS

This is a Preliminary Amendment which is filed before the date of the first office action on the above referenced application. In this Preliminary Amendment, Applicant has:

(a) Added new claims 61-64.

No New Matter

Support for new claims 61-64 is found in the specification from page 12 to page 24, including, but not limited to, at page 16, lines 14-15 and at page 18, lines 1-2, which generally describes the milling of fibers from stock material. The level of skill in the art is shown by the book Tool and Manufacturing Engineers Handbook, (Society of Manufacturing Engineers, 3rd ed.) pages 6-28 through 6-33 of which has been submitted in an Information Disclosure Statement (IDS) mailed contemporaneously with this Second Preliminary Amendment (a copy of the materials submitted in that IDS is enclosed for the Examiner's convenience). Pages 6-28 through 6-33 describe general knowledge in the field of milling regarding metal removal rates, feeds, and speeds for various metals including aluminum, copper, iron, magnesium, nickel, titanium, and zinc.

Accordingly, while the examples presented in the application as originally filed discussed the production of fibers made from zinc (Application pages 24-28), those of ordinary skill in the milling art would necessarily recognize that the general discussion of milling stock material necessarily disclosed how to make fibers from other metals which are commonly milled including aluminum, copper, iron, magnesium, nickel, and titanium, and alloys thereof based upon the disclosure in the specification and the knowledge of milling of persons of ordinary skill in the milling art. See MPEP 2163 II.A.3(b).

Finally, silver and cadmium are not specifically mentioned in the Tool and Manufacturing Engineers Handbook at pages 6-28 through 6-33. Nonetheless, the Brinell hardness of cadmium and silver are both within the range of normal hardness for milled material as shown on page 6-31 of Tool and Manufacturing Engineers Handbook. (See e.g. web pages showing physical properties of cadmium and silver as submitted in the above identified IDS). Therefore, those of ordinary skill in the milling art would necessarily recognize that the general discussion of milling stock material necessarily disclosed how to make fibers from other materials which are within the normal hardness range of material milled including cadmium and silver and alloys thereof based upon the disclosure in the specification and the knowledge of milling of persons of ordinary skill in the milling art. See MPEP 2163 II.A.3(b).

Accordingly, the amendments contained herein introduce no new matter in the application. Examination and consideration of the application, as amended, is respectfully requested.

A fee transmittal sheet is enclosed, along with a check in the amount of $72 for the additional claims added by way of this Preliminary Amendment. In the event Applicant has inadvertently overlooked the need for any additional fee, Applicant authorizes any deficiency to be charged to deposit account number 09-0007. When doing so, please refer to our File No. P00629-US-0(13929.0007).

Respectfully submitted,

James D. Wood
Attorney for Applicant
Attorney Registration No.: 43,285
ICE MILLER
One American Square, Box 82001
Indianapolis, Indiana 46282-0002
Telephone: (317) 236-2233
Facsimile: (317) 592-4610

Enclosures: Exhibit A – Version of Claims with Marking to Show Changes Made
Exhibit B – Clean Version of Claims
Copy of Materials Submitted in IDS
Fee Transmittal Sheet
Return Postcard
Check in the amount of $72.00

cc: Mr. James Dyer (w/out enclosures)
Doreen J. Gridley, Esq. (w/out enclosures)

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